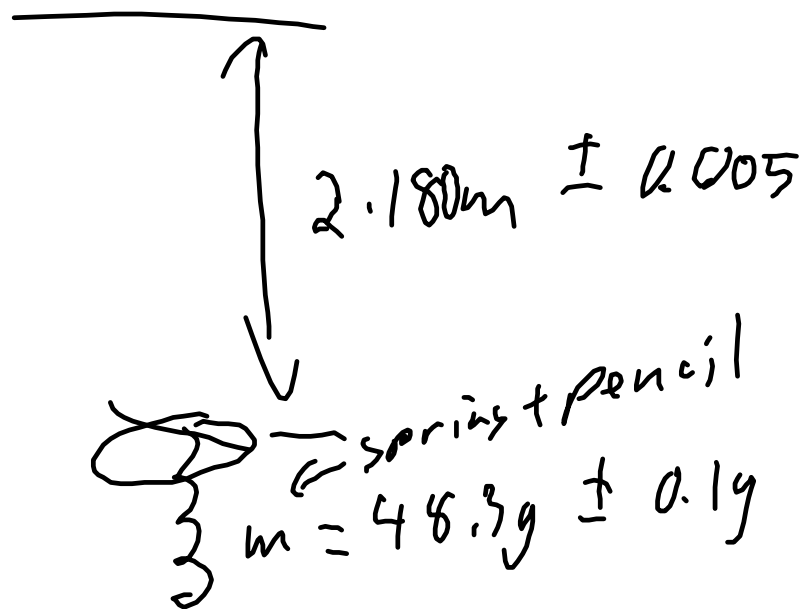


## Momentum and Energy review quiz next class

10 minutes:  
measurements on the spring and



$$\begin{aligned} F &= 11.5N \pm 0.3N \quad x = 20.0 \pm 0.5cm \\ &= 6.0N \pm 0.3N \quad x = 10.0 \pm 0.5cm \\ &= 16.0N \pm 0.3N \quad x = 30.0 \pm 0.5cm \end{aligned}$$

Drive in the snow:

I don't know

$F=ma$  less a less  $F$  required -  
ease on the accelerator pedal and on the brake  
if the wheels spin or lock - stop pushing on the pedal

Go slow through corners. Spinning and sliding melt the snow, that refreezes as ice.

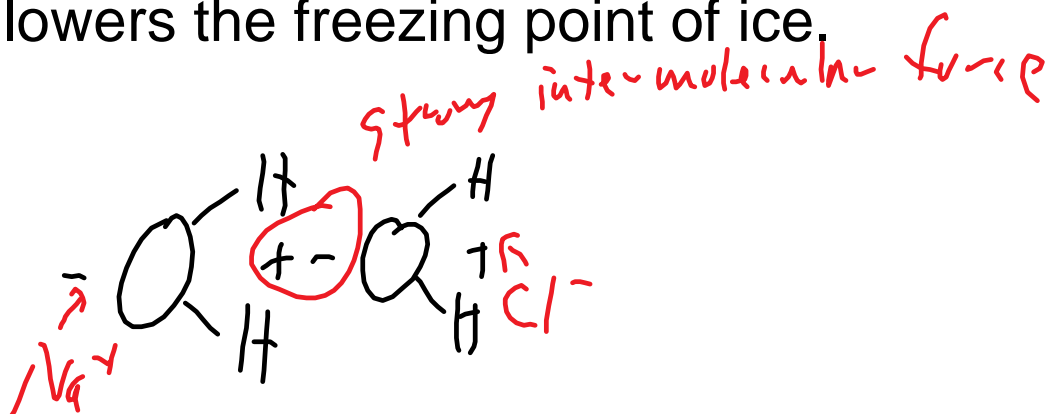
If the wheels are moving with the ground, you have static friction but if the wheels spin or slide you have kinetic friction which is less.

Don't Panic!

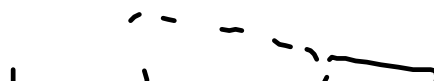
start in second gear - lower torque - mechanical advantage - less output force

keep a big bag of sand or salt in the car, put under the wheels to improve traction and the extra weight increases the normal force and therefore the friction. Have friends for extra weight and can push - extra force.

Salt lowers the freezing point of ice.

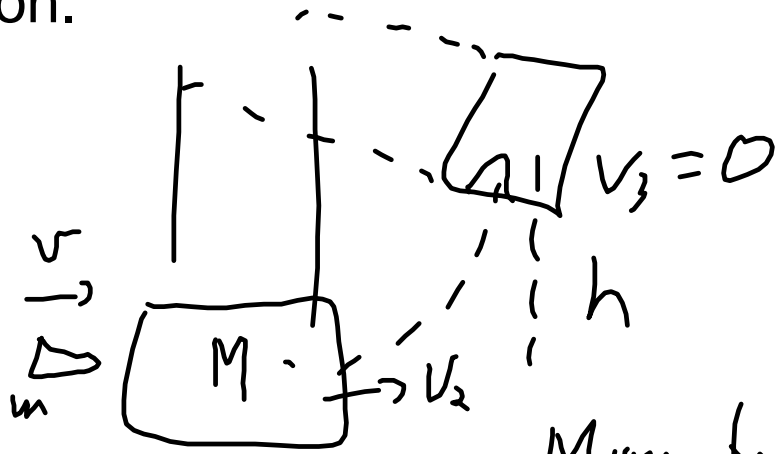


trying to drive up a hill, you should speed up (increase the kinetic energy) so you can slide up the hill (gravitational energy) without good propulsion.



propulsion.

Q59



2 parts

- 1 - Momentum is conserved - collision
- 2 - Total energy is conserved - swing

$$1) \quad mv = (M+m)v_2$$

$$2) \quad \frac{1}{2} (\cancel{M+m}) v_0^2 = (\cancel{M+m}) gh$$

$$v_0^2 = 2gh$$

$$v_2 = \sqrt{2gh}$$

$$mv = (M+m) \sqrt{2gh}$$

$$v = \frac{(M+m) \sqrt{2gh}}{m}$$

$$v = \left( \frac{M}{m} + 1 \right) \sqrt{2gh}$$

Jeff is winning with above lights but below pipes